

ECONOMIC INQUIRIES

AND

STUDIES

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ECONOMIC INQUIRIES AND STUDIES

XIII.

THE UTILITY OF COMMON STATISTICS.¹

I N commencing our labours for another session, we are painfully reminded that during the past twelve months the Society has sustained two heavy losses, in the death of Mr. Newmarch and Professor Jevons. At a meeting like the present, some tribute is due to the memory of these distinguished members. To some extent a record of Mr. Newmarch's death and services has already been preserved in our proceedings, but something, I feel, ought also to be said at this inaugural meeting, considering his many and diversified statistical labours, and the length of the period during which he was identified with us, first as Secretary and Editor of the "Journal," and afterwards as President. The death of Professor Jevons—all the more to be regretted as a lamentable accident—has occurred since the last meeting of last session, and this is the first opportunity we have had of paying a tribute to his memory.

With regard to Mr. Newmarch, it will be unnecessary to go over the record of his life in detail, or to enumerate his various works; of these a very full account will be found in the March number of the "Journal" of this year. What I should like to do now is to put on record the special consideration in

¹ Inaugural Address as President of the Statistical Society. Delivered on Tuesday, 21st November, 1882.

which he was held here for his knowledge of economic statistics, especially trade and banking statistics, and his skill in using them. He was remarkable not merely as a statistician, but as a man of business and as an economist, and his special *forte* as a statistician was to throw light on problems connected with the theory of business—especially banking—and on the applications of political economy to the real world by means of statistics. In labours of this kind he was among the first in the field. Mr. Tooke, whom he recognized as a master, had preceded him as a pioneer, showing the way to reason out disputed points in the theory of currency and banking by statistical illustrations from actual business experience: his demonstrations on such points as the dependence of prices on credit, and the fact of a rise of prices preceding and not succeeding the expansion of a paper currency, being still among the best examples of the right use of statistics in economic discussions. But Mr. Newmarch followed in the steps of his great master with a command of facts, and a power of analyzing and grouping figures, which in the same field were at that time without example. His most signal achievement was the preparation of the last two volumes of the “History of Prices,” a book well known here, though it has been long out of print. The information and comments in those two volumes on the great economic changes about the middle of the present century, including the introduction of free trade, the Bank Charter Act, the Irish famine, the French revolution of 1848-51, the gold discoveries in Russia, California, and Australia, and finally the Crimean war, make them still a most valuable record; while the discussion on many points of banking practice and economic theory, especially on all points relating to the use and abuse of credit, and the periodicity of movements in trade, remains to this day the fullest exposition on these topics to which the student can be referred. There are better books perhaps on single points, such as Mr. Bagehot’s “Lombard Street,” in

which the constituent elements of the money market are described, and the theory of a bank reserve is set forth and illustrated; but the number and variety of topics in Mr. Newmarch's book, and the way in which the various economic movements of the time are grasped and set in one picture, make it of unique value. Whether it is the effect of the gold discoveries in bringing new resources into the money market, and giving a vast impetus to trade, or the effect of a great movement of migration on the trade of old and new countries alike, or the financial consequences of a great war, Mr. Newmarch is at home in the discussion. Apart also from the light it throws on the special questions treated, and as regards which it may be of course superseded by fuller and later statistics, and by wholly new circumstances, the book must long remain of value, I believe, as a specimen of method and of what can be done by the use of statistics. Indirectly, I believe, it has been the beginning of much financial writing, as it is really the parent of a book like M. Neumann-Spallart's "Annual Review of the World's Trade," on the one hand, and of much of that writing on "trade and finance" and those columns of "City notes" which we now see in many newspapers. Mr. Newmarch, in fact, popularized the idea that the daily changes in the movement of business can be generalized and referred to the working of the laws of human nature, and in a thousand ways the idea has been worked out and made useful to the world. That in the end the course of business will be better understood generally, with useful results both to business men and to society, there can be little doubt.

Besides thus recognizing Mr. Newmarch's special place as a statistician, we are bound to say a few words here on his special services to the Society. Among these I would place in the first rank his labours as editor of the "Journal." Looking over the back numbers, it may be perceived that from the time he took the "Journal" in hand there was not only a considerable

improvement in the miscellaneous information, which was more particularly in his own care, but an improvement as well in the general character of the papers read at our meetings. One explanation of this improvement must of course have been the steady growth of the Society in numbers and resources, and in the standard of statistical excellence; but the improvement was not altogether a spontaneous growth from below, it was encouraged from above in a variety of ways. I can speak from personal knowledge of Mr. Newmarch's exertions to make the best use of his materials, and to diffuse a genuine love and appreciation of the study he favoured. It was extremely characteristic of him that to the last he was strongly interested in young men. Wherever he could see any talent or liking for economics and statistics in a younger generation than his own, he was the first to applaud. I am proud to acknowledge for myself that I owe the beginning of my close connection with the business of the Society to Mr. Newmarch's kindness, and I have had reason to observe in many other cases his warm interest in youth, and the pains he took to encourage and bring others forward. His services, however, were manifold, and it is only fitting that, as he identified himself so closely with us, we should do honour to his name. The success of the Newmarch Memorial Fund must be to all of us a matter for satisfaction. The memory of the great services he rendered will be perpetuated in an appropriate manner.

In the death of Professor Jevons the Society has also sustained a very great loss. Partly because he was so much junior to Mr. Newmarch, and had probably many years of life left in which to render us distinguished service, and partly because of the engrossing nature of his literary work, which made formal business distasteful to him, Mr. Jevons never took the prominent part in the daily work of the Society for which his eminent gifts and labours as a statistician so well qualified him. He was for some years, how-

ever, one of our secretaries, a regular attendant of our meetings, and a frequent contributor to the "Journal." In the proper work of a statistician, moreover, there are few men who have left a better name on our records. I need only refer specially to three of his principal works. Twenty years ago, when he was still comparatively a young man, his book on the depreciation of gold arising from the gold discoveries justly attracted no small attention, both from the completeness of the method employed, and the striking character of the conclusion which he came to—that while there had been depreciation to a moderate extent, there had been no such depreciation as many great economists had anticipated. A few years afterwards his book on the "Coal Supply" drew attention to a problem which is inevitably raised by the limited character of the English coal field, and the rapidly increasing demands upon it. This book had a wide success of notoriety, and it was unfortunate, perhaps, that it was only too popular, the public, which seldom makes nice distinctions, running away with the notion that Mr. Jevons predicted the actual speedy exhaustion of the English coal supply. This, of course, was nonsense. His real conclusion, however, viz., that one of the present conditions of English prosperity was rapidly altering for the worse, was undeniable, and was amply justified by the experience of the coal famine of 1873. Few more interesting books have, perhaps, been written; and there are few better examples of the kind of statistical works which ought now, with the increasing breadth of statistical data, to be more largely written, viz., those dealing with the characteristic social and economic problems of the age. It is to such works statesmen and politicians must look for a right comprehension of their task. Shortly afterwards, in 1868, Mr. Jevons read a paper on the state of our gold coinage, in which the same thoroughness and completeness exhibited in all his statistical works was again conspicuous, and which has since been the model of more

than one similar inquiry. Besides these, Mr. Jevons wrote many smaller works, which were all characterized by great completeness of method; but these three larger works are quite sufficient to found his reputation. They all show inventiveness and resource, and a careful attention to every point which can qualify the figures so that the real facts, and not the apparent ones, are brought out. An index number, such as he used in the first paper of all on the gold question, has proved an instrument of great value since in all inquiries on prices; and for this institution of an "index number" we may consider ourselves indebted to Mr. Jevons.¹ In the later years of his life Mr. Jevons became even better known as an economist and a writer on logic than as a statistician, the place he took being a high one; and without discussing his work in that capacity, we must recognize how his qualifications for other departments of literature were no disqualification, but the reverse, for the study and practice of statistics. His statistics would not have been as good as they were if he had not had wider interests, and a remarkable faculty for clear scientific exposition in other branches of science.

Such are the two men we have lost within the short period of twelve months. The loss is a heavy one; but few would have been more ready to recognize than those we have lost that the work remains, whatever becomes of the individual. With Mr. Newmarch this feeling, as I have already hinted, was always present. It was always of good work in statistics and not of his own good work he was thinking. If younger men could be induced to come into the field, he was but too well pleased to give up the task to them, so long as the work was done. His example and spirit will be handed

¹ An index number was used by Mr. J. B. Smith as long ago as 1840 in giving evidence on the Bank Acts. Practically, Mr. Jevons was the first to systematize the use of the method. [See my evidence given to the Gold and Silver Commission for after-acquired information on this point.]

down, I trust, through many generations of labourers at these meetings. In another point also the example and spirit of both Mr. Newmarch and Mr. Jevons, it may be hoped, will be imitated. I have already glanced at the point, but it may be specially emphasized. It is that they were neither of them specialists, but they were both otherwise distinguished—Mr. Newmarch as a man of business and an economist; and Mr. Jevons, as a *littérateur*, a man of science, and a logician. It will be an unfortunate day for us if men of business like Mr. Newmarch, and men of general scientific and literary eminence like Mr. Jevons, do not take an interest in our pursuits. Statistics are related to so many different sciences, and the knowledge of them is so essential to the politician and historian, that there is no study which is more certainly failing to obtain its proper place, if it is not known to and made use of by those who are identified with other pursuits and by men of general culture.

I am sure you will not think I have taken up too much of your time in doing honour to the friends whom we have lost. I pass on with some diffidence to deal with some topic of general interest, such as you have been accustomed to have dealt with in their introductory addresses by my predecessors. In recent years the field has been very fully occupied. You have had such papers, for instance, as that of Mr. Lefevre, on the use and abuse of statistics, covering a great deal of the ground for discussion on the theory of statistics. You have had other papers by experts in particular branches of statistics, such as the addresses by my distinguished immediate predecessor,¹ on the agricultural depression of the country and the probable future of the agricultural industry. The field of new observation has thus been greatly reduced. It has occurred to me, however, that without attempting a new discussion on the theory of statistics, or giving an address on some

¹ Sir James Caird.

particular topic of urgent interest, I may perhaps be able to say something useful, by pointing out some of the uses to society of the more common figures of statistics, especially those figures which assist in modifying or directing the political thought of the time, or in presenting problems for politicians and philosophers to consider, even if they do not much assist in the solution. The greater successes of statistics, and their main uses, though not so well known as they should be, are nevertheless fairly understood. The construction of life insurance tables, for instance; the means of comparing rates of mortality in different places, and between the same places at different times; the constant utility of statistics in political discussion, and their equal utility in daily business—are all matters tolerably well known and admitted. But what seems not to be so well understood is our indebtedness to the common figures of statistics for many wide and far-reaching political ideas, which influence and guide political thought and action and philosophic speculation insensibly. With the systematic collection of statistics continued for many years, there has come to be published a whole library of statistical annuals—whether they are official statistical abstracts or *annuaires*, such as many countries now publish, or unofficial publications like the “*Annuaire d’Economie politique*,” or the “*Statesman’s Year Book*,” or M. Neumann-Spallart’s “*Annual Review of the World’s Industry*.” These books, it seems to me, besides having many practical uses, supply a necessity of political thought at the present time, and are constantly and insensibly guiding political and philosophical speculation. What I propose to discuss to-night, then, are some of the more common figures which lie on the surface of the most accessible books. As with other good and common things, we have become so used to such books that we hardly know what we should miss if they were blotted out,—if public men and writers were without them, as in fact they were without them until about half a century ago. If we

attempt to realize what we should do without such books, we shall not fail to see that statistics have many unsuspected uses, and not least are they useful for the knowledge they insensibly diffuse throughout the world.

I shall deal more especially with the most common figures of all, viz., those of population. The utility of the most general notion which we derive from statistics of the distribution of the earth's surface among different races and nations is palpable. We can see at once that a small corner like Europe is closely peopled by the European family of nations, whilst the northern peoples of that family also possess a large new field of territory in North America, Australia, and Northern Asia, and the more southern peoples a large new field of territory in Central and South America. The European family is thus *de facto* in possession of a large tract of the earth's surface for its own habitation, perhaps a half or more of the area available for producing the food of civilized races. Further consideration would show what races in particular, among the nations of Europe, have this inheritance; but the point is, the predominance of the European race in mere extent of territory, coupled with the peculiarity that the bulk of this population is still living on a comparatively narrow tract in Europe. The rest of the world—China, India and Africa—is possessed by races of greatly differing type, on whose territory Europeans do not press as colonists, though they may settle in small numbers as governors, or traders, or both. Granting, on the average, a difference in point of material strength per unit of population between these European and all other races, it is easy to understand at once the idea that the future of civilization belongs to the European group, and that the problem of how the other races are to live in harmony with the European group without being jostled, and in what way they are to be affected by the European civilization, is one of the

most curious presented for the solution of modern societies. If the European numbers were less, the problem might well be whether European civilization, in spite of its assumed superiority in type, could maintain itself. The numbers and rate of increase being what they are, it is easy to see that the main problem resulting from the relations of the European and non-European races cannot be whether the European civilization will be able to maintain itself by force, but how it will be affected by its varying relations to the other races.

Confining ourselves again to the European group, and first of all to the nations within European limits, another leading fact in international politics is immediately suggested by the statement of the numbers of the people. This is the existence of five leading powers—Russia, Germany, Austria, France, and the United Kingdom—each greatly stronger than any of the other powers not among the five, except two; each big enough to “take care of itself,” though there are, of course, differences of strength between them; and besides these, the two others excepted, viz., Italy and Spain, which come short of a first place, but by a less degree than the minor States. All these relations of the great powers are based largely on the mere enumeration of the peoples. Three out of the five, viz., France, Austria-Hungary, and the United Kingdom, have each about the same population, in round numbers, 35 to 38 millions; one of the others—Germany—has about one-fourth more, and Russia only has a much larger number in Europe, viz., 80 millions. While numbers, therefore, are not everything, or Russia would be preponderant, which is notoriously not the case, and Germany would not, as it does, count for more than in proportion to its numbers, and the United Kingdom would not have a peculiar position among the others, on account of the undeveloped state of its military resources on the one side, and the immensity of its

wealth and latent strength on the other side, yet it is obvious that the mere numbers are a most vital element in appreciating the political position of these five powers and the lesser powers around them. Perhaps if statesmen were always wise, and rulers and peoples free from prejudice and passion, the popular knowledge of the figures would be even more serviceable than it is in demonstrating the absolute insanity of offensive war. It is impossible to conceive what object any of these five great powers could gain by the misery and suffering of war with another, adequate to repay that misery and suffering: the very magnitude of the wars forbids the possibility of gain.

The past history and future prospects of the balance of power among these nations are also illustrated by a mere consideration of the numbers. We have only to glance at the population of the different States as at the close of the great wars in 1815 and as they are now, to see that great changes have happened:

	1815.		1880.	
	Population in Millions.	Per Cent. of Total.	Population in Millions.	Per Cent. of Total.
Russia in Europe	48	33	80 ¹	34
Germany ²	21	14 $\frac{1}{2}$	45	19
Austria-Hungary	28	20	38	16
France	29	20 $\frac{1}{2}$	37	16
United Kingdom	17	12	35	15
Total	143	100	235	100

Thus in 1815 a compact France possessed several millions more than the population of Germany, nearly

¹ The exact figure by the last census is 84 millions, but I have preferred to be a little under the mark, so as to allow a little for more exact enumeration in the latter censuses. For the present purpose the difference between 80 and 84 is immaterial.

² Germany was also much divided in 1815.

twice that of the United Kingdom, and more than half that of Russia. Austria-Hungary also came near, as it now does, to the French numbers. Now the population of Germany considerably exceeds that of France; that of the United Kingdom is nearly equal, and that of Russia is more than double. These facts correspond very closely with the transfer of military preponderance on the Continent from France to Germany, and with the increasing prominence of Russia, which would probably be much more felt but for the simultaneous growth of Germany. They also explain why it is that the United Kingdom, with an economic and social development resembling that of France in many respects, has fallen less behind in the political race; why its relative position among European powers, though not what it was fifty years ago, is less weakened than that of France has been. Fifty years ago it was the leader among powers which were occupied in restraining France, singly a greater power than any. Now it is about equal in numbers to France, although its whole position is changed by the fact that no power, not even Germany, preponderates to the same extent as France once did.

As regards the future again, what the figures suggest clearly is a possible rivalry between Russia and Germany, and the further relative decline of Austria and France—the United Kingdom continuing to grow, but occupying from year to year a different place, as its interest in the so-called balance of power becomes less. Our change towards Europe is, however, affected in part by the growth of our relations beyond seas, which is another of the great facts of population, evident on the surface of the figures, that I shall afterwards have to notice.

Of course these changes have had the effect of raising questions of domestic, as well as of foreign, interest; and here again we are indebted to statistics mainly for the suggestion of the questions. One of these questions is, in the case of France, what are the causes and

probable consequences, socially and economically, as well as in its relations in respect of the balance of power to its neighbours, of the stationariness of the population? This is one of the most remarkable facts, both in itself and in comparison with the facts of other countries, which population statistics disclose. The present would not be the place to discuss the answer to the questions raised, or the solution of the problems involved. All I am concerned to point out is that it is to the common figures of statistics, such as did not exist until the present century, that we owe the putting of the questions for answer. But for them it would not have been quite certain whether the population of France was stationary or not. Now the facts are exactly known and even familiar, and discussion goes on. Another question presented is as to the increase of population in countries like Germany and Russia, and the rapid encroachment there has been on the unused agricultural resources of those countries. As the stationariness of the population in France, however beneficial in some social aspects, is not an unmixed good, because it weakens France in its external political relations, so the increase of population in Germany and Russia, while they still remain mainly agricultural, appears to be attended by some mischiefs. The social condition of the rural population of Germany leaves much to be desired, as we may see from the extensive emigration, and from the difficulty of increasing the national revenue. In Russia, again, the threatened difficulties appear most formidable. Until lately Russia has been largely in the condition of a new country, with vast quantities of land over which a growing agricultural population could spread. Now the European area is more or less filled up, and unless the vast territory of Siberia can be largely utilized for settlement, which appears doubtful, the pressure of population on the means of subsistence in Russia may soon become very great. The soil may be capable of supporting with better agriculture a larger population: but this is not

the point. The kind of agriculture possible in any country is related to the existing capacity of the population, or to such improvements in that capacity as are in progress, and with the Russian population as it is, there are certainly traces in Russia of an increasing severity in the struggle for existence, which may at any moment become most serious. The change in the conditions of expansion for the population internally as compared with what they were fifty years ago ought at any rate to be recognized at the present day, suggested as they are by the most obvious statistics of Russian population. Italy, it may also be noticed, is fast increasing its population without any increase of new soil or corresponding increase of manufactures.

Last of all, another fact presented by these obvious figures is the dependence of the population of the United Kingdom very largely, and to a less degree of France, Germany, Belgium, and Holland, on the importations of food from abroad. The facts as to the United Kingdom have been much discussed in all their bearings lately, Mr. Bourne, as we know well, having taken a large part in the discussions; but you have only to turn to the pages of the "Statistical Abstract for Foreign Countries," to perceive that the United Kingdom is not quite isolated in the matter. It is much more dependent in degree than any other European country, but in the fact of dependence it is not altogether singular. The fact is, of course, partly due to the increase of population in far greater ratio than the increase of agricultural production, the prediction of Malthus, that the population of England would not be supported on the soil of England if it increased at anything like the rate in his time, having thus been verified, though not exactly as he anticipated; but it is also partly due to an increase in the consuming power of the same population, and the larger consumption of more expensive kinds of food, requiring larger proportionate areas to produce them. France, with a stationary population, increases its imports of food, and the in-

creased consumption per head among our own population of the quantity of such articles as sugar and tea also suggests that articles of home agricultural production are now consumed more largely than they were twenty years ago or more by the same numbers. To these two causes combined then, the increase of population and increase of consuming power per head, coupled with a comparatively stationary agriculture, Europe owes the unique phenomenon of large masses of population supported by imports from foreign and distant countries. The social and political consequences of this new fact must be manifold, and again it is to the common figures of statistics we owe our knowledge of it. This great fact would hardly be known at all if periodic censuses and the system of recording imports and exports had not previously been introduced.

Socially and politically perhaps the phenomenon is not yet sufficiently appreciated, and as compared with what it will be, it is probably only beginning to be important, but it is one which must before long play an important part in international politics and in the economic life of nations. Both the countries which grow the surplus food and the countries which receive it are profoundly concerned.

In another way the internal growth of population in different countries of Europe is also connected with great political changes. In Germany, for instance, it was partly the special growth of the population under the Prussian monarchy which assisted to make United Germany. In Russia, again, the great growth of population outside Poland has, from year to year, and decade to decade, dwarfed the Polish difficulty as a bare question of the balance of power in Russia. But we have even a more striking case of political change from the internal changes of population nearer home. Every one must have been struck, during the last few years, by the calmness of the country generally in presence of Irish agitation, and the evident hopelessness of any

insurrection arising out of that agitation. When Mr. Parnell and other Irish Members were arrested in October last year [1881], and the Land League suppressed, there was hardly even a fractional fall in consols. Forty, fifty, eighty years ago, things were entirely different, the Irish difficulty being incessantly spoken of as most menacing, which indeed it was. The present calmness and the former apprehension are obviously due very much to a mere change in population numbers. Ireland, at the beginning of the century, held about one-third of the population of the United Kingdom; as late as 1840 it still held very nearly one-third; now its population is only one-seventh. Apart from all relative changes in the wealth of the populations, these changes in numbers make a vast difference in the Irish difficulty. It becomes easier for us on the one hand to bear the idea of an alien State like Ireland in our close neighbourhood, wholly independent, or possessing Home Rule like the Isle of Man or the Channel Islands: the power of mischief of such a community is less to be feared by a State of England's greatness than was the power of a separate Ireland fifty or eighty years ago, by the England of that time. A separate Ireland then might have been used by France against the very existence of the English Empire and the independence of England itself. Now this would hardly be possible either to France or to any other State. On the other hand, any possible insurrection in Ireland is as nothing to the power of the United Kingdom compared with what it would have been when Ireland held a third of the whole population. Hence the calmness of recent years in comparison with the agitation of a former period, and which is all the more remarkable because the agitated memories survive and colour a good deal of the thought about the Irish difficulty still. A still more careful examination would show, I think, that the difficulty has diminished in intensity—that it is the alien part of Ireland which has most diminished in numbers, while the loyal part—

Ulster—has relatively increased; but here again I wish to confine myself to patent and obvious figures, the lesson of which has more or less sunk into the popular mind.

It is not difficult to perceive, moreover, that these changes in figures must gradually tell more effectively than they have yet done on the Irish difficulty. In 1832 Ireland was endowed with one hundred and five members, its proportion of the population of the United Kingdom being then one-third. If one-third was then considered to entitle it to one hundred and five members, one-seventh, it is clear, would only give it at the present day about forty-five. Of these forty-five, again, one-third would be from Ulster, and almost exclusively among the remaining two-thirds, or thirty in all, if we are to judge from the present appearance, should we find Home Rulers. The parliamentary Home Rule difficulty would thus seem to have largely arisen from the failure to adapt the representation of the country to changes in the population. There is certainly nothing in the increased wealth or vigour of the Irish population, compared with that of the rest of the United Kingdom, to suggest that Ireland should have a larger representation in proportion to its population than it had in 1832; yet if its representation were only to be reduced in proportion, the parliamentary difficulty would largely disappear. Even if no greater change were now to be made than the introduction of equal electoral districts, and assuming that the present changes in population continue, and that Irish representation is adapted to the probable relative population of Ireland and the United Kingdom at the next census, then the representatives of Ireland in Parliament would be reduced from one hundred and five to eighty-three, and of these eighty-three only fifty-five would be sent from those parts of Ireland in which there is disaffection, so that the maximum number of Home Rulers, unless there are great changes of party, which I am not discussing, would apparently be less than fifty-five. Of course I

am not discussing the possibility or expediency of any political changes. I am merely pointing out the ideas which the figures on the surface are suggesting for consideration, and which must affect the politics of the next few years. Here again it is the common figures of statistics—those derived from the systematic record of facts commenced within the last century, and only brought to a condition of tolerable advancement within the last fifty years, which are so fertile and suggestive.¹

Still continuing the use of the most common statistics of population, I propose next to direct attention to one of the most formidable problems which have to be dealt with by our imperial government, and for the knowledge of which we are mainly indebted to statistics. I refer to the growth of the population of our great dependency—India. I have already referred in the most general terms to the peculiar and complicated relations which are likely to grow up between nations of the European family and the races or nations of different types. At no point are these relations more interesting than they are in connection with the supremacy the English race has gained over the subject races of India. The point of interest in these relations for our present purpose lies, however, chiefly in this—that the Roman peace we have established in India appears to be effective in removing many obstacles to the growth of population which formerly existed—what Malthus described as the natural checks—so that under our rule the Indian population is growing in numbers from year to year, and trenching with alarming rapidity on the means of subsistence. I believe I am within the mark in saying that there is no more anxious subject for the consideration of our public men. The late Mr. Bagehot I know was profoundly impressed by the fact, and repeatedly wrote his impressions, though I do not remember whether anything he wrote is collected among his

¹ See *supra*, vol. i., p. 277.

published writings. Others of our leading public men and economists are also deeply impressed by the fact, though it is considered almost too delicate for public discussion. There can be no doubt, however, of the formidable nature of the problem. India has now on its 1,400,000 square miles of territory a population of 240 millions—I am dealing in round figures—or about 170 to the square mile: not an excessive proportion according to formal comparisons with other countries, but in reality leaving the people no margin. It appears, from the most careful studies, that whatever the number of people to the square mile, there is very little new and fertile soil to appropriate; that much soil has been so appropriated during the last century of our rule; and that the population continues to grow fast without any increase of the land revenue, or any other sign that land is being rapidly taken into cultivation—with signs, on the contrary, of exhaustion in the agriculture, and of an approach to the limits of production according to the means at the disposal of the population. So much is more or less accurately known by statistics; and of the cardinal fact—the magnitude and increase of the population—it is statistics from which we learn everything. The broad figures are here not so clear as they might be, because improved methods in taking the censuses have from time to time revealed larger populations than could be accounted for by taking the totals of one previous census and adding the probable or possible increase of population meanwhile; but of the actual fact of increase between two census periods there is no doubt, while the rate of increase, if we are successful in coping with famines, proves to be nearly 1 per cent. per annum. In ten years, therefore, there will be 20 millions more people in India to feed; in twenty years upwards of 40 millions more; and the problem thus brought before the Indian Government is in what way and by what means so to develop the character of the people that their industry may become more efficient upon practically the same soil. Failing any

speedy alteration in the character of the people, the prospect seems inevitably to be that in India from decade to decade larger and larger masses of the semi-pauperized or wholly pauperized, the landless classes, as Sir James Caird calls them in the Famine Commission report, will grow up, requiring State subventions to feed them, and threatening all attempts to reform Indian finance, while raising social and political difficulties of the most dangerous kind. It seems certain, then, that India for many years to come will be an increasingly dangerous problem for our statesmen to deal with—the more dangerous perhaps because any change in the character of the people, bringing with it increased energy of production and increased strength of character altogether, will also bring with it a rise in the scale of living, tending to make the masses discontented instead of submissive to their lot. Whatever course events may take, our rule in India must apparently for generations become a problem of increasing difficulty and complexity. The problem is analogous to what seems to lie before a government like that of Russia, with this difference, that the government is in Russia a native institution, whereas in India it is that of an alien nation governing a host of subject races.

I shall be told, perhaps, that if statistics suggest problems like this, they are only making us uncomfortable before the time: the evils apprehended are purely speculative. But in the case of India this cannot be said. The actual creation of a famine fund is a proof that the evil is imminent. The fund is created in order to secure that large numbers of people are kept alive in times of famine, millions being in this way semi-pauperized. The prospect is that before long there may be millions to be kept alive in non-famine and famine years alike, people without land or means of living, and without the possibility of being employed as labourers. Thus the difference between the present condition of things and what seems imminent, unless, as I have stated, there is an unlooked-for change in

the character of the people, is one not of kind but of degree. The statistics only bring to light and set out an immediate difficulty. The solution at present devised of a famine fund by which millions of the Indian people are virtually pauperized is certainly not one to be contemplated with any satisfaction. It may be unavoidable, but from the point of view of civilization and progress it is little more than a confession of the hopelessness of the difficulty.

The last broad fact I shall refer to as presented and made familiar to us by these statistics of population is that of the growth of population in the United States—a subject, perhaps, of even greater interest than any I have yet referred to, and complicated also with one or two interesting questions already glanced at, viz., the existence and increase of large European populations which are supported by imports of food from new countries, and mainly from the United States. In this case I may have to make some use in passing, not merely of common and familiar figures, but of a few less generally known; but I shall use none except what are easily accessible, and in all cases the ideas to be presented will be those suggested by what is common and familiar.

The broad fact presented by the United States is that of the doubling of the population in periods of about twenty-five years. There is a little doubt about the exact population at the time of the War of Independence, and down to the first census at the beginning of the present century, but for the present purpose the figures we get are good enough:

	In Milns.		In Milns.
1780	3.0	1840	17.1
'90	4.0	'50	23.2
1800	5.3	'60	31.4
'10	7.2	'70	38.5
'20	9.6	'80	50.1
'30	12.9		

In other words, the population of the United States has multiplied itself by sixteen in the course of the century—this being the result of its doubling itself every twenty-five years for that period. In another twenty-five years, at the same rate of increase, the population will be 100 millions, in fifty years 200 millions, in seventy-five years 400 millions, and at the end of a century 800 millions! Such is the first aspect of the broad fact presented to our consideration by the increase of population in the United States. The rate is such as to be fairly bewildering in its probable consequences. The phenomenon is also without a precedent in history. There has been no such increase of population anywhere on a similar scale, and above all no such increase of a highly civilized and richly fed population. The increase is not only unprecedented in mere numbers, but it is an increase of the most expensively living population that has ever been in the world. For the idea of such an increase we are indebted exclusively to statistics. The United States, among the other new ideas of old civilizations they have had the benefit of, have had the idea of a periodical census, which is even made a part of their constitution, and as the result we have before us, not only in a general way, but with some precision, so that discussion may have an assured basis, this phenomenon of an unprecedented increase of population which is perhaps the greatest political and economic fact of the age.

The fact has altered in the first place the whole idea of the balance of power of the European nations. A century ago the European nations in their political relations thought little but of each other. Now the idea of a new Europe on the other side of the Atlantic affects every speculation, however much the new people keep themselves aloof from European politics. The horizon has been enlarged, as it were, and the mere fact of the United States dwarfs and, I think, restrains the rivalries at home. European Governments can no longer have the notion that they are playing the first

part on the stage of the world's political history. And this sense of being dwarfed will probably increase in time. In this country, at any rate, we cannot but feel greatly attracted by the United States. Because of the magnitude of that country, the European continent is less to us—our relations are elsewhere.

It is in connection, however, with our own home problems of population that the increase of the United States is most interesting to us. The increase is partly at our expense, and at that of the other European nations. If the United States or some other new country had not received our emigrants, it is quite clear that our whole history would have been different from what it is. We should either have had in our midst the people who emigrated, and their descendants, straining the resources of our soil and mines and capital, or the pressure upon these resources would have checked in various ways the growth of the population itself, so that probably at this moment, but for the new countries, more people would now be living in the United Kingdom than there are, and larger numbers of the population would be paupers, or on the verge of pauperism. The actual numbers we have lost altogether, and specially to the United States, have been:

	To United States.	Altogether.
Before 1820	50,000	123,000
1820-30	100,000	247,000
'30-40	308,000	703,000
'40-50	1,094,000	1,684,000
'51-52 ¹	511,000	704,000
'53-60	805,000	1,312,000
'60-70	1,132,000	1,571,000
'70-80	1,087,000	1,678,000
Total	5,087,000	8,022,000

¹ Previous to this date the figures include foreigners.

Some correction of these figures would be necessary in the earlier years for foreigners included, and in the later years for persons returning home, but the correction in the present view would make no material difference. If these people had not emigrated, and had increased as the rest of the population has done at home, the existing population in the United Kingdom would now be many millions more than it is. The difference made by the emigration to the United States alone must be a good many millions.

The influence of the United States and other new countries has been greater still. On a rough calculation about 12 millions at least of the people of the United Kingdom live on imported food, and a certain part of the populations of Germany, France, Belgium, and Holland also live on imported food—the importations being mainly from the United States. These new countries therefore not only have permitted an increase of population in a century, till it is sixteen times the population at starting, but a much larger increase. To take the United States alone, we cannot estimate its contribution to the support of foreign populations at less than an amount equal to the support of a population of 10 millions, similar in character to that of the United Kingdom. Its exports of bread-stuffs and provisions are now about 90 million pounds annually, at the value as they leave the United States; and at £9 per head, corresponding approximately to a value in the United Kingdom of £11 per head, which is about our consumption of agricultural products per head, this would be equal to the support of 10 million persons. In other words, then, the United States, from supporting 3 millions of people a century ago, are now supporting at least 60 millions—virtually an increase of twenty times the original number. The growth of population thus becomes more astonishing than ever. Altogether there must be about 15 millions of people in Europe supported by the produce of the new countries; and adding together the populations of Canada,

Australia, and the United States to this 15 millions, less a deduction for the population in these countries a century ago, there remains a total of about 70 millions of European population,¹ or about one-fifth of the population now living in Europe, which is supported by the produce of newly opened regions. The history of Europe we may well say would have been entirely different from what it has been during the last century but for the new countries. It is difficult indeed to over-estimate the extent to which the existence of a new field for population, such as the United States presents, has dominated the recent economic history of Europe. We are so accustomed to a set of economic circumstances in which population, constantly increasing in numbers and in the capacity for food consumption per head, finds practically unlimited means of expansion, that we can hardly understand economists like Malthus who were oppressed by the only too evident limits which nature, at the time he wrote, had apparently set.

It seems impossible, however, not to see that a period in which the pressure of limits to growth and expansion may again be felt is not far off. The approach of such a period seems to me to be suggested by the figures which are on the surface, and I may perhaps be permitted to anticipate that the idea of such an approach, if it is not now, will soon become a familiar subject for speculation.

The very language in which reference has been made to the increase of population in the United States itself, viz., that the present rate of increase implies twenty-five years hence a population of 100 millions, a hundred years hence a population of 800 millions,

¹ To make these figures quite exact, a correction ought to be made on account of the non-European element in the population of the United States, the coloured population in 1880 being about $6\frac{1}{2}$ millions. The coloured population in the United States, however, is brought into competition with the European, and in some degree Europeanized. It seems unnecessary, therefore, for our present purpose, to make any correction.

indicates that a continuance of this rate of increase may be considered incredible. It implies future changes in the industrial power of the race which we have no warrant to anticipate. The area of the United States, exclusive of Alaska, which does not count, is 3 million square miles, and of this area there are at least 1 million square miles, if not more, which are sterile or rainless, so that cultivation, so far as we can now foresee, is out of the question. There remain then 2 million square miles, and on this area a population of 800 millions would give 400 to the square mile—one-third as much again as the present population per square mile in the United Kingdom, twice as much per square mile as the population of the United Kingdom which is supported by the home agriculture, and more than twice as much per square mile as the present population of France. Allowing for the greater consuming power of people in the United States as compared with that of the French people, this is as much as to say that a rate of increase of population like what has been going on in the United States for a century is impossible in the next century, unless the power of the human race to extract food from the soil is enormously increased. No doubt the United States may lose in each decade that special force of addition to its rate of increase due to immigration. As its own population increases, the proportion of the area from which immigrants are drawn will diminish, and hence there is apparent reason to anticipate that the proportion of the immigration itself will diminish. But at present there is hardly a sign of change in the proportion of the immigration, and for some time to come at least no material difference seems likely from this cause in the rate of increase of the United States population. The increase of population between 1870 and 1880 was almost at as great a rate as any that has occurred. Besides, it does not follow that the diminution of the area from which immigrants are drawn should diminish the immigration itself. Other things being equal, a larger and larger share of the increasing

population of older countries will emigrate, and if they do not emigrate they will have to be supported by the import of food from new countries, which comes to the same thing. Moreover, a much smaller increase in the United States than we have supposed, say to 400 millions only in a century, would presuppose practically so violent a change in existing economic conditions, that the difference between it and the more violent change which an increase of population to the larger figure would require need not be considered.

The bare statement of such figures appears to me quite enough to indicate that the present economic circumstances of the European family of nations, including the United States as an offshoot and part of the family, are not likely to continue for more than a generation or two. We are within measurable distance of very great changes. No doubt there are other new lands—in Australia, in Canada, at the Cape, and elsewhere—which will be more or less available in the future; but, singly, the United States is so much the larger field, that the influence of these other new lands need not be considered. Assuming the United States to possess only half the area of new country available for the European races, a single doubling of the population, after the United States has been filled up—the work of a generation or two—would absorb all these other new lands; their existence only postpones the date when they will all be in the position calculated for America alone at the end of a century by thirty years or so. In the course of a century, then, we may affirm that the present economic circumstances of the European races which make possible an indefinite expansion of the numbers of the people, coupled with an increase of their consuming power, will have entirely changed.

The facts appear to me so interesting, that I ask leave to add something more, though the figures I have now to give you, while easily accessible, are not quite so much on the surface, and have not been popularized.

These figures relate to the actual appropriation of land for settlement, and the actual growth of population in the new and old States respectively. What I wish to bring out is that a much larger portion of the available area of the United States has been "taken for settlement" than is commonly imagined; that in fact not only the thirteen original States and their three subsections have been so taken for settlement, but what are known as the Western States, exclusive of the Pacific territories, have also been taken for settlement; that the growth of rural population in this second group of States has now brought them nearly to the level of the rural population in the older States; that there is no longer much room for growth by taking up new lands in all these portions of the States; that the remaining available area is so small as to render inevitable its being taken for settlement before very long; and that from this point, probably within twenty or thirty years, the new economic circumstances I have been referring to must begin to make themselves felt.

The total area of the United States, according to the last census, exclusive of Alaska, is given as 3,025,600 square miles, of which there is a land surface of 2,970,000 square miles. Of this the portion belonging to each of the three groups named, with the quantities of each respectively taken for settlement, is as follows, the figures being worked out from the data of area and population as given by the last census:

Area of United States and Area taken for Settlement, in Three Groups.

	Total Area.	Area taken for Settlement.
GROUP I.	Square miles.	Square miles.
Thirteen to sixteen original States .	393,000	362,000
GROUP II.		
Twelve Western and Southern States ¹	605,000	560,000
GROUP III.		
Remaining States and Territories—		
<i>a.</i> Six Far West States ²	620,000	370,000
<i>b.</i> Pacific States and Territories ³ .	1,407,000	277,000
Total of Group III.	2,027,000	647,000
Grand Total	3,025,000	1,569,000

Thus out of the total area of 3 million odd square miles, rather more than one-half is the area taken for settlement; and the area not for settlement is almost exclusively in the last group of all. This group I have subdivided in two sections, the first comprising States like Iowa and Minnesota, more or less completely settled, and the second comprising the Pacific States and Territories; and of the first subsection, it will be observed, more than half is already included in the area taken for settlement. The question then arises—How much of the unsettled portion is available for settlement? and to this the answer must be, little. When I mention that Mr. Porter, a well-known American statistician, and one of the Tariff Commission now sitting, in his book on “The West,” estimates that there are

¹ Viz., Kentucky, Tennessee, Ohio, Indiana, Illinois, Michigan, Missouri, Arkansas, Louisiana, Mississippi, Alabama, and Florida.

² Viz., Iowa, Wisconsin, Minnesota, Kansas, Nebraska, and Texas.

³ Viz., California, Oregon, Dakota, Colorado, Nevada, Arizona, Idaho, Montana, Wyoming, Utah, New Mexico, Washington.

1,400,000 square miles of territory in the West, of which only a tithe will ever be available for cultivation, it will be seen that the wholly unoccupied portion of the available territory must now be reduced to very small dimensions.

The next point to which I wish to draw attention is the actual population of the first two groups, exclusive of the town population, and the proportion to the square mile. This figure I work out from the tables at pp. 26-31 of the Introduction to the Population Statistics of the United States Census:

Net Rural Population of the United States, exclusive of the Town Population, in different Groups of States, with the Numbers per Square Mile.

	Total Population.	Town Population.	Net Rural Population.	Number per Square Mile of Rural Population.
Group I. . . .	21,835,111	7,939,334	13,895,777	35
„ II. . . .	19,656,666	3,614,835	16,041,831	26½
„ III. <i>a</i> . . .	6,761,132	847,282	5,913,850	9½
„ III. <i>b</i> . . .	1,902,874	534,659	1,368,215	1
Total of III. .	8,664,006	1,381,941	7,282,065	—
Grand Total .	50,155,783	12,936,110	37,219,673	12½

Thus while the rural population in the thirteen original States is 35 per square mile, it amounts to no less than 26½ per square mile in twelve other States which we are accustomed to speak of as more or less unoccupied. This is clearly not the case. An addition of 8½ per square mile, or of little more than 5 millions in all, would make them as populous as the rural parts of the original States. Group III. *a*, though it has a larger area to fill up, would nevertheless become as populous per square mile rurally as the older group of

States by an addition of about 15 millions of population. It appears, however, that a large part of this area belongs to the rainless region; so that probably less than two-thirds of this 15 millions would fill up the available area to the limit of the thirteen original States. There remains only the last division of all; but it would seem that the available area here cannot be put at more than 400,000 square miles, on which the present rural population would be about 3 per square mile; so that if the population grows to the limit of the older States, the addition to the population necessary would be about 10 to 12 millions only. Altogether an addition of about 20 to 25 millions to the rural population of the United States¹ would seem all that is required to occupy the available area in the same way that the oldest and most settled part is now occupied. When that point is reached, the present conditions of expansion must begin to change.

How long will it be till the point is reached? Some idea of this may be formed from a comparison of the increase of the total population with the increase of the city population. This is shown in a table at p. 29 of the Introduction to the Population Statistics of the Census, already referred to, from which it appears that the total population increased nearly 12 millions in the last census period, and the urban population nearly $3\frac{1}{2}$ millions, so that the rural population increased $8\frac{1}{2}$ millions.² Of course it may be urged that the rural population may have increased in the older parts of the country as well as the new, but it is interesting to observe how much of the absolute increase of population is in the second and third groups, and not in the first. This is shown in the table on the next page, extracted from the "Introduction to the United States Census."

¹ Viz., 5 millions to second group, 10 millions to Group III.*a*, and 10 millions to Group III.*b*.

² The following is a copy of the figures here referred to, the urban population here accounted for, however, being somewhat less than

Population and Number of Inhabitants per Square Mile in each of Three Groups in the United States at the Date of each Census.¹

Date.	First Group.		Second Group.		Third Group.	
	Population.	Average Density (Persons to a Square Mile).	Population.	Average Density (Persons to a Square Mile).	Population.	Average Density (Persons to a Square Mile).
1790 . .	3,819,846	17.0	109,368	7.2	—	—
1800 . .	4,922,070	18.5	386,413	9.8	—	—
'10 . .	6,161,566	20.6	1,078,315	9.8	—	—
'20 . .	7,417,432	23.8	2,216,390	11.3	—	—
'30 . .	9,158,721	26.3	3,707,299	13.1	—	—
'40 . .	10,638,004	30.1	6,357,392	14.5	74,057	4.7
'50 . .	13,218,496	36.7	9,078,288	18.4	895,092	7.1
'60 . .	15,818,547	43.8	12,637,882	24.3	2,968,892	9.5
'70 . .	17,964,592	50.1	15,594,721	29.5	4,999,058	12.9
'80 . .	21,835,111	60.3	19,656,666	35.1	8,664,006	13.4

Thus in the last decade about 4 millions of the total increase of population is in the second group, and 3,700,000 in the last group. At this rate, clearly, the increase of population in the second group in ten years from 1880, if all agricultural, would be such as nearly

above stated, which includes towns of a smaller size than are reckoned in this comparative table:

Number of Total Population of United States at each Census, and Number of Urban Population, with the Proportion of the Urban to the Total.

Date.	Population of United States.	Population of Cities.	Inhabitants of Cities to each Hundred of Total Population.
1790	3,929,214	131,472	3.3
1800	5,308,483	210,873	3.9
'10	7,239,881	356,920	4.9
'20	9,633,822	475,135	4.9
'30	12,866,020	864,509	6.7
'40	17,069,453	1,453,994	8.5
'50	23,191,876	2,897,586	12.5
'60	31,443,321	5,072,256	16.1
'70	38,558,371	8,071,875	20.7
'80	50,155,783	11,318,547	22.5

¹ To prevent misunderstanding, it should be noted that the figures per square mile in this table refer to the whole population, whereas in the table on p. 30 the figures relate to the rural population only.

to fill up the country with a rural population to the level of the older States, while the same increase would go a very long way towards filling up the last group in the same way. But the speed with which the vacuum will be filled will probably be even greater. The population in the new regions grows at an increasing rate as regards amounts. In 1840 the population in the third group was about 74,000 only; in 1850 it had increased by rather more than 800,000; by 1860 there had been a further increase of 2 millions; by 1870 there had been another addition of 2 millions; and between 1870 and 1880 there is an addition of nearly 4 millions. Thus only in one decennial period, viz., between 1860 and 1870, is the increase less than about double what it had been in the previous decennial period. The increase of population in this new region at the past rate would therefore be, not 4 millions, but 8 millions, or about half what is required to fill up the region with a rural population to the level of the thirteen original States. By 1890, therefore, not only will the second group of States very probably be filled up to the level of the thirteen original States, but the work of filling up the last group of all will have advanced very nearly towards completion. In another ten years, that is by 1900, assuming the same progressive rate of increase, the addition to the population in the last group of all would be 16 millions, which would be far more than sufficient to fill up the vacuum.

There is still another way of looking at the matter. During the decennial period 1870-80, the increase of population in the United States was about equally distributed between the three groups—about 4 millions to each, the increase in the first group being, however, mainly in the cities. Assuming an equal division of the 50 millions additional population which will be on the territory of the United States in twenty-five years—and it is more likely that the Western States will have a larger proportionate share—this would give 16

millions more to the second group, or 11 millions more than is necessary to fill up the rural districts to the level of the Eastern States, and 16 millions to the third group, which would suffice to fill the rural districts to the Eastern level. Even looking at the matter in this way, then, the prospect is that the available area in the United States will be peopled up to the level of the thirteen original States, as regards the rural population, in the course of twenty-five years. But the distribution of the increase between the groups, as I have said, is likely to be unequal, and the West will probably be filled up with even greater rapidity. To look at the matter in yet another aspect: of the 50 millions additional population, assuming an increase of the town population like what has been going on in the past, about 12 millions will be a town population, leaving 38 millions as the rural increase. But unless rural population is to increase in the original States, and is also to increase in the second group to more than the present level of the original States, the whole of this 38 millions, except the 5 millions required for the growth of rural population in the second group to the level of the original States, will be left for the occupation of the available area in the third group, or double what is required. Whatever way we look at the matter then, it seems certain that in twenty-five years' time, and probably before that date, the limitation of area in the United States will be felt. There will be no longer vast tracts of virgin land for the settler. The whole available area will be peopled agriculturally, as the Eastern States are now peopled.¹

¹ These various calculations may be put more shortly still. Assuming the available area for settlement to be altogether 2 million square miles—and it seems not quite so much—this would absorb altogether, at 35 per square mile, a rural population of 70 millions. With that number the entire available area of the United States would have as thickly settled a rural population as the thirteen original States now have. But the present rural population being over 37 millions, only 33 millions more at the outside are needed to fill up the available area to the level of the Eastern States, or less than the

All this must involve a great change in the conditions of the growth of population and the general economic conditions of the country. It confirms in the most ample manner what was to be surmised from the bare statement of the geometric increase of population itself, pointing as it did to a population of 800 millions at the end of a century from this time. Long before that it is plain, and I think quite certainly within twenty-five years, the conditions of the expansion of population must be substantially different from what they are now.

It will be urged that it is notorious the United States can support enormous masses of population. Its available agricultural area in round figures is twelve or thirteen times that of the United Kingdom, and eight times that of France. Considering what the population of the United Kingdom or that of France is, and the superior fertility of many tracts of the United States, it appears safe enough to assume that the United States can support an indefinite increase of population, and that there is room for great expansion of population within the settled area. But assuming all this to be the case, what we may observe is that it is not quite to the present point. This is not a question of supporting a large population anyhow; *how* they are to be supported is here all-important. The moment there is little new land to occupy, the conditions of expansion must change; every year must bring nearer the date when the fruits of the soil will be extracted with increasing difficulty. The agriculture must become different from what it is now. What has been already said, moreover, as to the United Kingdom and France not supporting all their own population, and as to what the position in the United States would be, even as compared with the United Kingdom and France, if the geometric increase in the United States should continue no more than a century, estimated addition to the rural population at the present rate of increase in the next twenty-five years.

may show that there is, after all, no room for an indefinite expansion of population within the settled area in the United States. I should like to go further, and suggest that the limits of such expansion, without a very great and almost inconceivable change in the agriculture itself, must be very narrow. Comparisons with European States on this head seem very apt to mislead. But the figure of 35 per square mile as the rural population of the older parts of the United States is, after all, one-fourth of the agricultural population of France per square mile; and there are two important differences between the agriculture of France and the United States: 1. The consuming power of the United States population is much greater, perhaps double that of the French population, so that the soil cannot be expected to support the same number of Americans as French. 2. The western farmer in the United States grows for export, not merely to the towns of the country, but abroad. A rural population one-fourth that of France may thus be quite sufficient to settle up the country. We must not come to the subject with European ideas as to the scale of living.

It would be foreign to my purpose to indulge in speculation as to what will be the consequences of this approach to a complete settlement of the United States, coupled with the fact that population, whether in the United Kingdom, or in Germany, or in the United States, shows no sign of abatement in the rate of increase. It is sufficient for my purpose to point out that as the existence of vast tracts of virgin soil in the United States has permitted, during the last hundred years, an expansion of the European population without a precedent in history, has made the economic history of Europe in that period entirely different from what it would otherwise have been, so now the approach to a complete settlement must profoundly affect the world. The conditions of economic growth will be fundamentally altered. Possibly there may be chemical or other inventions rendering possible great

improvements in agriculture, which will have practically the same effect as an increase of the quantity of new land available. Possibly we may have the rate of growth of population itself checked. But with the change of one condition others must change, if the masses of European people are to remain at their present level of prosperity. If there is no change, the nature of the difficulties that will arise is obvious: the masses of labourers will have to contend under increasing difficulties¹ against a fall in the scale of living.

But while I refrain from indulging in general speculation, I may, perhaps, be allowed to point out some of the more immediate consequences which are likely to follow from an approach to complete settlement in the United States, of which we seem to be within a measurable distance. First of all there will probably be a diversion of a larger part of the stream of emigration from Europe and the Eastern States of the American Union to the north-west provinces of Canada. Here there are probably about 400,000 square miles of territory available for settlement, equal in quality to the best land in the United States West. As there is no such field in the United States itself, the stream must apparently be to the new land.² The second immediate consequence I should look for would be an increase of manufactures and of town population in the United States. The agricultural outlet becoming less tempting, and agricultural wages tending to fall, the population will inevitably be more and more largely drawn into manufacturing.² And a third consequence will probably be a check to the tide of emigration from older countries, a greater demand upon the agriculture of those countries, or at least a mitigation of the extreme competition it now sustains from virgin soils,

¹ See "Some Leading Principles of Political Economy Newly Expounded." By J. E. Cairnes, M.A. Macmillan and Co., 1874. Pp. 332-334.

² These anticipations are now being fulfilled [1903-4].

and possibly a reversal of the present tendency for rents to fall. Such changes may hardly be apparent for a few years, with the exception, perhaps, of the diversion of the stream of emigration to the north-west of Canada, which has begun; but it seems hardly possible to doubt that they must begin to be felt before very long—perhaps in the course of ten, and almost certainly in the course of twenty years.¹

To sum up this long review. These easy figures of population evidently go to the heart of much of our politics and political economy. To quote only the illustrations I have given, we may say, first, they give some idea of the mass of the European populations in the world, and consequently of the overwhelming strength of European civilization. Next, as we have seen, they help to explain the existence of five leading powers in Europe, and the changes in the balance of power which have occurred in the last fifty or sixty years. They equally help to explain domestic changes in each country, such as the diminished intensity of the Irish difficulty in the United Kingdom, or the growth of social difficulties in a country like Russia through the population increasing with no other opening but a restricted agriculture, or such external difficulties as we have brought on ourselves by the conquest of India and the Roman peace we have established. Finally, they set before us in a clear light the great economic phenomenon of our time, the creation of the United States of America, and the provision by this and similar agencies for a growth of population, not only in the United States, but in Europe, which is entirely without precedent. I have endeavoured to supplement the last figures with a few others designed to throw light on the question of the continuance of this portentous

¹ As a matter of fact the second and third of these consequences have followed very much as stated in the text, while the first—the influx of population into the Canadian north-west—is now (1903) attracting no small attention.

growth, and the probability of a check to it; but the figures here used are also easily accessible. I trust you will agree with me that we may conclude from all this review, that the easy figures of statistics which we are all more or less familiar with are fruitful. How impossible it would be even to conceive some of the problems which are now raised for discussion if there were no statistics, and how inexplicable many of the facts of the present day and of history would become if statistics did not explain them.

If time permitted, it would not be difficult to show how other familiar figures in statistics also supply problems for discussion, and colour all our political thought. Let me only add, however, that the fact of these easy figures being so useful should encourage the development of the study of statistics. Familiar as are some of the things we have been discussing, it is often too evident that they are not sufficiently appreciated—that hazy ideas are widely held which a clear knowledge of statistics would disperse. Still more, not only should the accessible and easy figures be more studied, but it is most desirable to digest other masses of figures and increase the field of what can be readily understood. The difficulties in the way in some branches, as in the case of many trade figures, the figures of national income, and the like, are enormous, in consequence of the varying aspects of the data and the difficulty of impressing on the public mind some of the most elementary conceptions of the statistician, such as the propriety of using figures of trade on an imperfect basis to show progress or the reverse for a series of years, because the basis, though imperfect, is throughout the same. There is no doubt, however, that with time and attention, order can be educed of what is now chaotic to the public mind, and many facts of some complexity brought to the general knowledge. We have likewise to remember that time is working with us. The influence of simple population statistics upon political thought, and in suggesting

ideas which colour literature and philosophy, which has been our theme to-night, is the result of a systematic collection of statistics, which commenced only eighty years ago, and which is still extremely deficient. We may reasonably hope for more light from statistics as time passes by, and as it becomes possible to draw out comparisons over longer periods. The statisticians of the present day labour for the future, and we need not be discouraged if in many departments we have yet to wait for results. [1882.]

XIV.

ON INTERNATIONAL STATISTICAL COMPARISONS.¹

AN old jest runs to the effect that there are three degrees of comparison among liars. There are liars, there are outrageous liars, and there are scientific experts. This has lately been adapted to throw dirt upon statistics. There are three degrees of comparison, it is said, in lying. There are lies, there are outrageous lies, and there are statistics. Statisticians can afford to laugh at and profit by jests at their expense. There is so much knowledge which is unattainable except by statistics, especially the knowledge of the condition and growth of communities in the mass, that, even if the blunders in using statistics were greater and more frequent than they are, the study would still be indispensable. But just because we can afford to laugh at such jests we should be ready to turn them to account, and it is not difficult to discover one of the principal occasions for the jest I have quoted, and profit by the lesson.

Statistics are easily mishandled, for the simple reason, amongst others, that people like short cuts, and they are apt to take different figures and compare them with each other, because the things represented by them are called by the same names, without any consideration of the question how the figures are obtained, and whether the things compared are throughout of a like kind. Thus two states will be compared with each other as regards their revenue for Imperial purposes,

¹ Paper read at the meeting of the Australasian Association for the Advancement of Science at Hobart, January, 1892. Reprinted in "Economic Journal" for that year.

without any consideration of the fact that in the one certain expenses of government are borne on the Imperial budget, which in the other are borne on the local budget, or perhaps left to private agency; or without any consideration of such a fact as the inclusion in the one budget of loans or the proceeds of the sales of public property as revenue, which in the other are excluded altogether, or specially dealt with. The statistics, however, are not lies in themselves; it is only in the handling of them that the lying takes place. I have thought it would be of interest, therefore, in a meeting like this, to raise explicitly for discussion some of the principal dangers in the handling of statistics to which the inexpert, and some of us perhaps, who think we are expert, are exposed, through the too ready comparison with each other of figures which apparently are applied to facts of a like kind, but which really cover dissimilar facts. Such a discussion becomes more and more indispensable, I think, on account of one of the most important causes of the increased diffusion of statistical knowledge in recent years—the extensive development of statistical abstracts, hand-books, year-books, manuals, dictionaries, statistical atlases, and such like works of reference. Accustomed to see quantities, which are really dissimilar in kind, placed together under the same heading, which is done primarily for the mere purpose of reference, we come to neglect the dissimilarity in our speech, and, by and by, in thought. The numbers of different communities are compared as if numbers alone were something in themselves, without any thought of the different qualities of the units: production, imports and exports, and money wages in different communities are spoken of as if they in all cases meant the same things, and without any preliminary discussion of what the figures really do mean. All this is essentially mischievous, and is contrary to the most elementary lessons in the study of statistics. It is the part of the student to re-act against the

temptation to which he is exposed to use works which are only good for reference in this haphazard fashion.

Population Statistics.

At the risk of being commonplace through enforcing considerations which no one will dispute, I propose to begin with the foundation statistics of all—those of population. It is obvious at the first sight, when the statement is made, that for very few purposes can the populations of different countries be placed together as if the units were the same. The peoples of Europe and the United States are as a rule units of a very different value from the units of population in Hindoo, Chinese, negro, and aboriginal communities. Even among European peoples themselves there are enormous differences.

It follows, then, that many questions of first importance for which statistics of population are used, cannot be discussed at all without reference to the quality of the units. The fact has only to be stated to be admitted. Among such questions, for instance, is the question of the population that a given area will support. The plain of Bengal, say, supports some seventy million Hindoos—the population, in numbers, of the United States. But if the consuming power of the Hindoo were at all like that of the average man of the United States, how many could Bengal support? The same, *mutatis mutandis*, comparing even a French or German with a United States population. The units in the different cases are entirely different. The area of the United States might suffice with the same total value of production that it now has for the support of perhaps twice as many French or Germans as it could support of people of the actual type of those now planted on the soil of the United States. The question may be turned about another way. Along with the increased capacity of consumption there may, or may not, be an increased capacity of production. If there is such

an increase of the capacity of production, or even a greater proportionate increase than there is of consumption, it might well be that on the area of Bengal there could be planted an even larger population than there now is, yet with the average consuming power of the people of the United States, and not merely the average consuming power of the Hindoo. So greatly different may be the varying units of population which we are so ready to speak of as alike.

Among other questions of the same kind is that of the strength of different populations for war and industry. The differences between peoples are really almost infinite, and are not always coincident as regards war and industry. The Hindoo population, for instance, appears to be differentiated from a European race in respect of fighting force to a much greater extent ~~than~~ it is differentiated in respect of industrial force. The Chinese population, on the other hand, though it is weaker at present than European populations in fighting power, as well as industrial power, is, perhaps, not so much differentiated as the Hindoo is, and presents altogether a more difficult problem for their possible or probable antagonists. Negro populations, again, are differentiated in a different way, having a capacity for great exertion in some directions, but not in others. Such differences among peoples are so obvious that no one will dispute them when stated.

Even if units of population were generally alike instead of varying greatly, and in all sorts of directions, another question arises with reference to frequent comparisons of population and areas. The number of inhabitants per square mile is often quoted as denoting conditions adverse or favourable to the populations concerned. But of course there are areas and areas, originally and as modified by the qualities of the people dwelling upon them. In order to make a comparison of the number of inhabitants per square mile of any practical value at all, the nature of the areas, and of the qualities of the inhabitants, must be studied, and the

facts must also be adapted to the discussion of particular questions, such as the relation of area to conditions of health, and the like. To say, for instance, that Belgium has so many inhabitants to the square mile, and France so many fewer, does not mean anything, because the size of the communities compared is entirely different, and in point of fact there may be areas included in France more thickly peopled than Belgium. It is the same in the comparison of a European country with the United States. The conditions are entirely different; while not a few of the comparisons so readily made would be upset by the consideration that one-third of the area of the United States, excluding Alaska, is desert, and is, properly speaking, not inhabitable at all. A similar remark would also apply to the countries of Australasia treated as a unit. The facts are all useful enough for reference; that is not disputed; but the moment they come to be discussed, the nature of the quantities must be studied, and strict attention given to the point of the comparison attempted.

Connected with this last is another question of the same kind. What is the area which really supports a given population? If people on a given spot are able to carry on industries which enable them to buy from the rest of the world what they want, are they supported by that area, or are they not? In a sense they are supported, for they live by the industries which they carry on there. In another sense they are not, because they are not self-contained. Foreign trade is the breath of their life. But this description is applicable not merely to countries like the United Kingdom, which manufacture largely, and carry goods largely for all the world: it is equally applicable to a country like the United States, which exports food, raw cotton, and other raw materials, wherewith to buy the things of which it stands in need; or to countries like Australasia, which export wool, the precious metals and other metals, to an extent without example in history.

All these considerations are so obvious that I have

to apologize for introducing them. No one, it will be urged, can make the blunder of overlooking them. But in point of fact, and this is my justification, the grossest blunders are constantly made. We know, for instance, in regard to the question of the population which a given area will support, that nothing is so common in books of travel or geographies, with reference to unoccupied or partially occupied areas, than statements that a given area will support so many million inhabitants. Nothing is said as to what kind of inhabitants. But clearly the sort of inhabitants will make all the difference. The idea of boundlessness of area so common in new countries, and which is to some extent an illusion, if I may venture the remark, is also due to neglect of the fact of quality of population. The area of a given country in a sense may be practically boundless, but it may be equally true that the full occupation of the country would imply a continual re-adaptation of the people to new economic conditions—that there is by no means boundless room for the same sort of people carrying on the same sort of industries. To the same effect, the idea of narrowness of area so common in old countries, where there is constant wonder as to what is to be done with the growing population, is based largely on the vague assumption that there must be some proportion between area and population, whereas, as we have seen, and as experience proves, populations of indefinite magnitude may be supported on narrow territory. Every city is an illustration in disproof of the supposed connection between population and area in the sense stated. Area is no doubt necessary to a wholly self-contained people, if such a people can be conceived of, short of one which occupies the whole habitable territory of the globe; but, as no nation is self-contained, there is equally no means of settling *a priori* the maximum limit of inhabitants per square mile which a community may occupy; and that a nation reaches a high maximum is no proof of its being in an unfavourable economic condition, or the reverse.

Other illustrations may be given of an underlying confusion of thought in these matters, which occasionally comes to the surface. I have seen, for instance, at home an attempt made to show that the English Empire is more aggressive than that of Russia, because in a given period it had annexed a larger area and a larger population than Russia had done, the truth being that the area annexed by either country in the period in question was largely desert, so that it hardly counted one way or the other, and that the populations annexed were of most various quality. The point of real aggressiveness or not was studiously overlooked in this ingenious statistical comparison. Constantly at home, also, there are continual discussions on the balance of power, in which the numbers of the populations and the armies they can put in the field are simply counted; whereas the whole question turns largely upon the quality of the respective populations and the state of their warlike preparations, and not so much upon mere numbers. The question of quality of population arises in a different way in those political questions which are settled by numbers at the ballot-box in democratic communities, and I am not sure but that some of the underlying assumptions of politics are based on the refusal to recognize the essential differences of different peoples, as, for instance, in the concession at home to the people of Ireland of an equality and, really, far more than an equality, of voting power and representation in the Imperial Parliament, whereas, in some qualities, such as wealth, they cannot be regarded as equal, although they may be equal, or superior, in other qualities. Commonplace, therefore, as it seems, to say that, when we see columns of comparative figures of population, we must not assume the units to be alike, the applications of the doctrine are not really commonplace. We are all subject to the influence of unexpressed and underlying assumptions, and I have only given a few out of many possible illustrations of the dangers that may arise in using these very

ordinary figures without constantly thinking of what they mean.

I come finally to less debatable ground in one way, but where there is practical mischief from the misuse of figures. Nothing is more common than to compare populations which may be assumed to be racially very nearly alike, or approximating in certain qualities, but which really differ greatly from each other in regard to the distribution of the population according to age. France and Germany, for instance, are continually spoken of as if the difference of their numbers made a corresponding difference in their force. In fact the population of Germany contains a much larger percentage of children than that of France does, and the numbers of adults in the two countries do not differ so much in proportion as their total numbers do.

To show what differences there may be in the relative proportions according to ages in different communities, I have brought together certain figures extracted from the last census, in each case showing the total numbers, the total male population, the males above the age of 20, and the males between 20 and 40, in France, Germany, and the United Kingdom, respectively. (See Table A annexed.) From this it will be seen that France, with a population of close on 38 millions, has 11,828,000 males above 20; and Germany, with a population of just under 47 million inhabitants, or upwards of 20 per cent. more than that of France, has 12,435,000 males above the age of 20, or only 5 per cent. more of this class of the population than France has. The proportion of males above 20 is in the one case 31 per cent., and in the other $26\frac{1}{2}$ per cent. only. In the United Kingdom, where the total numbers, by the last census available for me in preparing this paper, are less than in either France or Germany, the proportion of males above 20 to the total population is $25\frac{1}{2}$ per cent. only. On the other hand, the number of males between 20 and 40 is proportioned more equally in each case to the total numbers of the population, being about

a seventh. Consequently France, although it has a total male population approximating to that of Germany, in spite of its smaller numbers, has only 5,376,000 males between 20 and 40, as compared with 6,577,000 in Germany; while the United Kingdom, with its smaller population than France, had in 1881 very nearly the French numbers of males between 20 and 40. No doubt in 1891 the figures would show a still greater superiority on the part of Germany to France in this particular, while the United Kingdom would be nearly on an equality, but without the very latest figures these are good enough for illustration. France has undoubtedly a much greater mass of old lives to support in proportion to its population than either Germany or the United Kingdom. As they all have, however, the same proportion of males between 20 and 40, it follows that in Germany and the United Kingdom there is a much heavier burden of children than in France. These are material differences in the constitution of the respective populations. At present the burden on the vigorous in each case is much the same, though heaviest, perhaps, in the case of France, as the old lives may be assumed to be more costly than the young, but natural growth must inevitably make an enormous difference in a few generations. Every ten years Germany and the United Kingdom, with the same proportion of non-effectives to support that France has, add greatly to their total numbers, and increase their preponderance over France in numbers alone.

The point is not without interest in comparisons between young and old countries. There are many comparisons in which, owing to the different composition of the population in a new country from what it is in an old country, the apparent superiority of the new country is to be explained, not by any superior quality, but by the mere fact that there is a less percentage of the people at ages above 40, and a larger percentage in the prime of life, than there is in an old country. For this reason in part there may be less mortality, less

sickness, and larger consumption of certain necessities and luxuries, in a new country than there is in an old country measured *per head*. But so far as this explanation holds, there is no superiority in the race of the new country over the old. As far as rates of mortality are concerned, statisticians in Australasia are familiar with the fact, and quote rates not upon the actual population, but upon a standard population in which the totals are redistributed according to age, but the correction is required in many other directions as well.

Moreover, although statisticians are usually correct when they deal with such figures, the point is not without practical importance. I have seen arguments at home, for instance, in which the attempt has been made to prove the superiority of Australians to the people of the United Kingdom in respect of health by means of statistics of the general rate of mortality among the two populations, no account being taken of the different distribution of the populations according to age. The comparisons I have in my mind failed on another point, being based upon a hypothesis as to the connection between mortality rates and the sickness of a population which had not been proved to be true generally; but even if the hypothesis had been generally true, the neglect of the point of distribution according to age made it entirely misleading.

Mortality Statistics.

I pass on to other statistics. Reference has already been made to mortality statistics in connection with the special point of the constitution of populations according to age, but there are many other traps in using such statistics for a comparison between nations. The mere question of how the deaths are recorded, and along with that the births, as far as many inferences from the mortality statistics are concerned, here becomes important. Before the statistics of two countries can be

compared there must be a certainty that the registration process as to numbers is effective and complete in each. This is not the case in all countries, and it is an especially important matter in historical investigations even in the same country; the registration of births and deaths in England, for instance, being notoriously deficient until a comparatively modern period. Even a great country like the United States is still most deficient in this vital particular; there is no such thing as a good birth and death rate for that great country. In Philadelphia some years ago a local report of the registrar of births, deaths, and marriages was put into my hands, from which it appeared that the deaths exceeded the births. I learnt on inquiry that the explanation of a fact which would have been somewhat startling if true was simply the neglect of the laws or administration in the matter of the registration of births. I do not know whether there has been improvement since in this particular city of the United States, but that there is still a lack of a uniform and effective system of registration throughout the country is most certain. It is necessary then to reiterate again and again the necessity for the utmost caution in the use of such common figures as birth and death rates. Always when a writer would make a comparison, let him see that his facts are really comparable. He must not be content to take them from a dictionary without inquiring.

These remarks hold good of other comparisons sometimes made, particularly as to the prevalence of certain kinds of disease. I need not say to an audience of experts what difficulties arise in the definition of disease, and how doctors, apart from mistakes as to what the disease really is of which a man dies, may honestly vary in their statement of the fact from the number of causes themselves, one doctor giving a proximate and another an ultimate cause. Before statistical comparisons can be made, something must be ascertained as to whether definitions and method of registration are substantially the same in the two countries compared. In historical

investigations, even in the same country, the precaution is equally indispensable.

Statistics as to Character of Population.

I proceed next to statistics, from which inferences are commonly drawn as to the qualities of a population—I mean statistics on such subjects as education, crime, sexual morality, drunkenness, insolvency, and thrift. On all these points different countries have statistics, which may have a meaning when they are properly used, but which it is most difficult to use properly.

To begin with education. Which is the most fortunate population of the world as regards the general education of the people? One often hears of the United States in this connection—of the numbers of children of school age and the numbers attending school as compared with less fortunate populations. But let me take the following passage from a memorandum by Mr. (afterwards Sir Joshua) Fitch, one of Her Majesty's chief inspectors of training colleges, on the working of the Free School system in the United States, France, and Belgium:

“In England and Wales the calculations of average attendance are made on the assumption that every school is open at least 400 times or 200 days in the year. It is on this basis that the annual returns in the official report of the Education Department state the average attendance of scholars in infant schools and departments to be 68 per cent., and that in schools for older children to be 82.2 per cent. But in the United States there is no uniform or generally accepted rule respecting the length of the school year. In the principal cities, especially in the East and West, the schools are open ten months out of twelve, and in these the statistics of attendance may be fairly compared with our own. But taking the country through, the average number of days in which the public schools are open is 129 in the year, and this fact implies that in the country places, especially in the South Atlantic and South Central States, the number of school days falls much below that average. In Alabama and in Georgia the schools are open only three months in the year, the teachers are paid by the month, and hold no permanent appointment. In Louisiana and Missouri the small sum appropriated to education by the State barely suffices to keep the schools at work more than four months in

the year. In Nebraska the returns for 5,407 schools show 3,904 to be kept open for six months and upwards, 529 for more than four but less than six months, and 974 for less than four months. In New Hampshire the average length of the school term is 22.9 weeks; in North Carolina it is twelve weeks; in South Carolina, three and a half months. In Texas the towns give an average of eight months, and the country districts five months. On the other hand, in some of the Atlantic States the rate is much higher. In Pennsylvania, exclusive of Philadelphia, in which the school year includes ten months, the average is 7.17 months; in Rhode Island, nine months eleven days; and in New Jersey, nine months ten days. It is manifest, therefore, that the figures representing the regularity of attendance require material correction and reduction before they can be properly compared with the statistics of European countries in which schools are, as a rule, kept open during nearly the whole of every year."

From this it is quite clear that one has the greatest difficulty in discussing such a question as the education of a people. You can hardly get to know to what extent children of school age are attending schools of some kind. There are other difficulties behind, as the report from which I have quoted shows, such as the difference of surroundings in which children find themselves when they leave school, the United States, from the general vigour and energy of the whole population, being much more favourable to the development of general intelligence and mental cultivation among its people than countries which may be more fortunate as regards primary school education. There is also the difficulty caused by the kind and character of secondary education, and the extent to which it is diffused. Simple at first sight as the problem seems, then, there is nothing more difficult than to compare some countries with each other as regards the degree of their education.

The second subject I have named in this connection is crime, and in thinking of it I confess I have had in mind certain comparisons which have been made in England by visitors returned from Australia to the disadvantage of Australia. There is twice the crime in Australian colonies per head of population, we have been told, that there is in England. But, as we all know who have to handle statistics, there are few statistics

so difficult to handle as those of crime. A distinction has to be made between mere police and administrative offences, which vary largely according to the things which Legislatures in their wisdom subject to fine or not, and the more serious offences, such as robbery and murder, which are what we think of when we talk of crime. But in hardly any two countries that I know of is the distinction drawn on exactly the same lines. You are almost never quite sure, therefore, what you are doing, unless you are specially careful, when you compare two countries as regards crime. Further, even if the distinctions were much the same, another difference is made by the police. You may have fewer trials and convictions in one country than in another, simply because the police for various reasons is less efficient, not because there is less crime. When comparisons, therefore, are made between the criminal statistics of two countries without attention to vital considerations like these to show that the subject has been really studied, it is safe to dismiss them without further thought.

But admitting that exact comparisons can be made, that statistics of crime in two countries are reduced to common denominators, I should like to point out that the logic of using them as indicative in any way of the general superiority of one population over another may be at fault. So far as can be judged, the so-called crime statistics of a country are not necessarily significant very much of the general quality of a population, but they may be significant only of the existence of a criminal element, which is like a disease from which a community suffers, but a disease of a superficial, and not of a vital character. One population may thus have more crime in it than another, even much more crime, but substantially the two peoples may be almost alike, the extent of the criminality in both being quite immaterial. Say, for instance, that the criminal population by which almost all the crime is done in one country is 1 in 500, or $\frac{1}{5}$ of 1 per cent., and in another population it is 1 in 250, or $\frac{2}{5}$ of 1 per cent., is not the criminal

element in either so small as to tell you nothing of the general constitution of the people? Not only, therefore, must criminal statistics be used with care as far as the mere data are concerned, but the difficulty of using them as indicative of the general qualities of a population is overwhelming. They can only be used, if used at all, in conjunction with much other information and statistics.

The statistics bearing on sexual morality are equally difficult to handle. The test here that is most commonly used is that of illegitimacy; but the truth is that illegitimacy by itself tells little, for the simple reason that in a town community there may be prostitution without illegitimate births, whereas in a rural community there may be even less profligacy than in the town, but with a larger number of illegitimate births, in consequence of there being no prostitution. In one country also the births may be registered as legitimate, through the children being born in wedlock; but this may go along with a general laxity of morals of a remarkable kind. Sexual immorality is also like crime itself, even when it can be measured on the same basis in two different communities, more or less a thing apart, and it may or may not be significant of the general *morale* of the population. I suppose it is true, for instance, that the rural population of Ireland stands better, as far as statistics of illegitimacy are concerned, than that of Scotland, but it would be a rash inference that in general *morale* the rural population of Ireland is superior to the Scotch. For certain purposes the statistics are good enough, but they must not be pushed to conclusions they do not bear.

Statistics as to drunkenness also require a good deal of careful handling. In fact, I see no way myself of establishing statistically that one population is more or less drunken than another. Apart from the difficulty already referred to, arising from the different distribution of two populations according to age, so that one population has proportionately more adults than another,

and consequently has a larger proportion of convictions for drunkenness and a larger proportionate consumption of alcoholic liquors—the two tests usually applied in such comparisons—it has to be considered that the tests themselves are not very good. The convictions for drunkenness, it is plain, like convictions for crime generally, may be very largely a matter of definition and of police administration. Before comparisons can be made, the state of legislation and of police administration in the countries compared must be considered. As regards the consumption of alcoholic liquors, again, I have never seen any statistics satisfactorily connecting a relatively large consumption of alcoholic liquors with drunkenness. On the contrary, the consumption in every community is probably at all times much more largely the consumption of sober people than that of people who drink to excess, and you may have much drunkenness among a people who, like the Americans, are generally total abstainers, and little among a people like the populations of the Southern States of Europe, who are generally moderate drinkers. Thus the question of drunkenness, or the reverse, in a population is not to be easily treated by statistics.

The statistics of bankruptcy or insolvency again are often quoted as a test of the comparative excellence of commercial communities. Here again I have had in my mind some recent comparisons at home between certain of the Australian colonies and England as regards insolvency. These colonies, we have been told, have twice as many failures per head of population as England, or some such proportion. But the traps in dealing with bankruptcy statistics are innumerable. Even in England it is not easy to compare one period with another, owing to difference of legislation making the conditions and record of official insolvency different at one time from what they are at another. The law at one time makes whitewashing so easy that debtors readily avail themselves of the courts to make themselves officially insolvent, and so you have a large

number of bankruptcies in the official statistics. At another time the law is so stringent that debtors evade the courts, while creditors do not make them bankrupt because it is not worth while to do so, and so the official bankruptcies diminish. At one time, also, non-traders may be made bankrupt, at another time they may not be; and so the record varies. Unless, therefore, the whole basis of the bankruptcy law in each case is studied, no comparison is possible either between period and period in the same country or between different countries. Further difficulties would arise in any comparison, owing to the length of the commercial cycle which renders it most dangerous to take the figures of one year only or even of two or three years for comparison. We can imagine, then, what wild work is made by amateurs when they compare the insolvency of Australia and England. Apart from these differences there are others which are due to fundamental differences of economic condition. I believe, for instance, that in England a larger proportion of the business done is carried on by Joint Stock Companies than is the case in Australia. This may or may not be the case. But, supposing it to be the case, how can the failures of England be compared at all with those of Australia, without taking account of the liquidations of Joint Stock Companies, and to how many units of individual failures is that of a Joint Stock Company to be considered equal? I would not go so far as to say that no useful comparison could be drawn from existing data by those who go carefully into the subject and study all the conditions. What I am contending for is, that it is utterly impossible for writers in a hurry to make anything of the first figures that come to hand, and assume that the official record of failures in one country at one time means the same thing as the official record of failures in a totally different country at the same or another time.

Here, too, I would also demur to the test of bankruptcy itself as indicative of the general commercial character of a people, even if figures for comparison

could be correctly ascertained. More bankruptcy in the one case than in the other may simply mean greater enterprise making more opportunity for failure, and not an excess of dishonesty in one compared with another. It may also mean that the industries carried on in one country, and which are suitable to be carried on in it, are essentially more fluctuating at a given period than the different industries of another country. Farming is often the most fluctuating of all industries. A country dependent on farming may suffer more from bankruptcy at a given date than a country less dependent. In turn, a manufacturing or commercial country may suffer more from catastrophes like war or invasion than an agricultural country would suffer. Perhaps even these difficulties could be overcome or evaded, and bankruptcy statistics be handled so as to indicate differences of character between two peoples; but the labour of the comparison would be very considerable indeed if anything is to be made of it at all.

I come finally to the last branch of statistics referred to as being often used to compare the character of two peoples, viz., the statistics of thrift or the diffusion of property among the masses. Here the temptation is to take some one form of saving, such as savings banks, or the holding of land, or investment in Government stocks, and roughly judge one people by their habits as to this one form of saving. So far as I have observed, the usual comparisons in detail, even as to the one branch of saving selected for comparison, are most erroneous. Thus, I have seen the number of separate inscriptions of French *rentes* in the books of the French Ministry of Finance treated as the number of separate holders. The truth is that the question of the number of inscriptions of *rentes*, the inscriptions being anonymous, is purely a formal matter, depending upon the subdivisions which are most convenient for dealing. One individual may, and as a rule does, hold many inscriptions. When the French issued new loans in 1871 and 1872 to pay the war indemnity